SOIL conservation

U. S. Department of Agriculture/Soil Conservation Service/March 1974

Wetlands and wildlife and weather

The importance of wetlands—marshes, bogs, swamps—is particularly evident at this time of year. For it is when the rains of early spring trickle, then fall, then pour down in nearly flood force that people are most aware of the need for natural or manmade ways to control or absorb excess water. It is then that wetlands do their "serious" job of sponging up extra rainwater and feeding it slowly back into the nation's streams and rivers.

Wetlands are not wastelands. They have the specific function mentioned. They are havens for birds and nurseries for aquatic life. They provide a major setting for hunters, birdwatchers, and fishermen to pursue their sport. And they are a vast outdoor classroom for amateur and professional scientists because they are the frontier between the two great ecosystems of land and water.

The Soil Conservation Service works with many people to preserve, improve, and wisely use our wetland resources. Perhaps our major—certainly our oldest—type of assistance is to thousands of individual farmers and ranchers. In 1973 alone, SCS assisted landowners to improve more than 9 million acres of uplands and more than 539,000 acres of wetlands for the use of wildlife.

SCS also works closely with organized groups such as the Nature Conservancy. The first "official" SCS assistance to the Nature Conservancy, in fact, was in Finzel Swamp, Maryland.

We continue to work with federal and state agencies interested in wetlands and wildlife. SCS joined with Wisconsin's Department of Natural Resources to help restore part of the 26,000-acre Brazeau Swamp to a more natural state. A road, acting as a dam, had raised the water level and saturated an area beyond its normal capacity, resulting in tree and shrub deterioration and a scarcity of food for wildlife. SCS helped design a channel to lower the water table to its natural level.

SCS people are pleased to be among the men and women actively preserving and improving wetland areas. It is part of our longtime objective of "using each acre within its capabilities and treating each acre in accordance with its needs for protection and improvement."

Wetlands as wetlands have many values. Yet it is a fact that the drainage of some wetlands for agriculture or buildings and other urban uses is as old as civilization. There will continue to be times and places when society feels that the value of a specific wetland, in its natural state, should be superseded by its value for some other purpose. As land use pressures mount, the American people should be fully informed of the special values of all lands, including wetlands, so these can be carefully considered in present and future land use decisions.

Kenneth E. Grant

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COVER: The Soil Conservation Service is working with landowners in Brevard County, Florida, in preparing conservation plans to help protect the Dusky seaside sparrow, a rare and endangered species. See "Duskies by the sea" on page 10. (Photograph courtesy of National Aeronautics and Space Administration.)

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Protection of rare and endangered species

by Gerald W. Root
State resource conservationist, SCS
Harrisburg, Pennsylvania

A national effort is underway to protect rare and endangered species of plants and animals, and many agencies and organizations—public and private—are cooperating in this effort.

Fortunately, enough public support has been gained to make significant progress in preventing extinction of several endangered species. Much more needs to be done, however, in protecting and managing habitat, understanding food chains, and identifying plant site requirements to prevent further decline of certain species.

In Pennsylvania, the Soil Conservation Service has gathered lists of rare and endangered species from federal, state, and private sources in an effort to assist in the compilation of a state list. A draft list has been sent to more than 150 colleges, universities, government agencies, and organizations for review and comment. It not only classifies species as rare, endangered, or questionable status but also attempts to identify habitat or site requirements for each species.

Presently 2 mammals, 10 fish, 1 bird, and 64 plants are in the rare category and 1 mammal, 17 fish, 1 amphibian, 4 birds, and 57 plants in the endangered category. In addition, 197 other plants are placed in a questionable status because of insufficient information to classify them as either rare or endangered.

Included in the questionable status group are some relatively common plants. Mountain laurel (*Kalmia latifolia*), for example, is Pennsylvania's state flower and was once common throughout the state. It is becoming scarce in the northern counties and needs continued protection aginst indiscriminate

At one time, the white-tailed deer all but disappeared in Pennsylvania. Conservation planning and management have increased the herd population to nearly 800,000.

Rare? Current estimates place the black bear population in Pennsylvania at 2,500 animals. An intensive research program by the state's Game Commission is aimed at finding ways to better manage bear range to insure the protection of this species.

collectors of its showy flowers.

Other plants, such as morningglory (Ipomoea *lacunosa*), may be rare in Pennsylvania because they are near the climatic limit of their range. Much more must be done in defining the range of such plants.

With the lesser plants—mosses, lichens, and algae—sufficient information is not available in terms of exact identification, range, and site requirements to determine their scarcity or abundance.

Finally, some plants, such as the box huckleberry (*Gaylussacia brachycera*), are extremely rare in Pennsylvania. Box huckleberry is known to occur only in two localities in the south-central part of the state.

Most of the plants and animals now rare or endangered in Pennsylvania originally thrived in the bogs, swamps, and timbered areas of the state. As man encroached more and more on these areas with his development and use of natural resources, many species declined because they were not adapted to the changed environment.

Fortunately, through efforts of the Pennsylvania Department of Environmental Resources, the Pennsylvania Fish and Game Commissions, the Soil Conservation Service, and other government agencies, large areas are being restored, managed, and protected against further damage by man.

About 10 percent of the state's land area (2.8 million acres) is now in federal or state ownership. Of this amount, about 2 million acres are managed according to a conservation plan for timber production, wildlife, and recreation. Some of these areas may be designated as wetlands, wilderness areas, or wild areas to insure their management and protection for future generations.

The Soil Conservation Service has assisted with the protection and management of about 800,000 acres of wetland and upland wildlife habitat on privately owned land. Most of these areas are maintained in native vegetation and managed to maximize conditions favorable for the preservation of rare and endangered species.

At one time in Pennsylvania's history, elk, deer, and turkey were endangered. Today, the state's deer herd approaches 800,000, turkeys abound, and estimates place the elk herd at approximately 100 animals—indications are that the herd is self-sustaining.

According to naturalists, nature's rate of extinction is about one species every thousand years. Man, in the last 300 years, has destroyed more than 200 forms of birds and mammals. If extinct reptiles, mammals, fish, and plants are added to this list, man's rate of extinction is more than one species per year. Only sound conservation and management of the remaining species, coupled with accelerated research, can reverse this trend. ♦

An endangered species thrives in northern Michigan

by Glenn E. Lamberg
District conservationist, SCS
Roscommon, Michigan

The Kirtland's warbler, a unique and endangered species, is thriving in the burned-over jack pine plains near the Au Sable River in northeastern lower Michigan. The nesting colony there is the only one known in the world.

This shy warbler is very demanding in its nesting requirements. It builds its nest on the dry sand at the base of the jack pine (*Pinus banksiana*). But not just any jack pine will do; the warbler selects only those pines that range from 6 to 15 feet in height. At least 80 acres of dense trees, with intermixed small openings, are needed for each colony of "jack pine" warbler.

Logging and the subsequent fires during the early 1900's in this part of Michigan provided ideal conditions for colonies of the tiny warbler. The effectiveness of recent fire prevention and suppression programs, however, have reduced nesting habitat for the warblers. Today, through the efforts of concerned individuals, organizations, and government agencies, this habitat is being maintained and preserved.

The Michigan Department of Natural Resources and the U.S. Forest Service have developed special programs to provide warbler habitat on both state and federal land. Program work includes controlled burning, special forest harvesting, tree planting, and acquiring private lands where this rare species of warbler is concentrated.

A spring flight takes the Kirtland's warbler from its winter home in the Abaco Islands of the Bahamas to Michigan's droughty sand plains. There, nesting colonies are concentrated mainly in Crawford and Oscoda Counties, between the towns of Grayling and Mio.

Census counts in 1961 revealed the warbler population to be aproximately 1,000. In 1972, the count had gone down to 400. What caused this decline? Apparently habitat conditions in the Bahamas and in Michigan remained satisfactory. Guilt focused on the brown-headed cowbird, an emigrant from the western plains.

The problem arises when the female cowbird lays her eggs in the warbler's nest. This brings about several effects detrimental to the warbler population. The warblers inadvertently raise the young cowbirds instead of their own young, that is, if they don't abandon their nest. In laying her unwanted eggs, the cowbird may destroy the already present warbler eggs. If the warbler eggs are not destroyed, death is usually inevitable for the nestling warblers because they can't compete for food with the much larger cowbird young.

The U.S. Department of the Interior's Bureau of Sport Fisheries and Wildlife has initiated a program to catch cowbirds. In the summer of 1972, nearly 2,000 of the unwanted intruders

Michigan's Huron Pines Resource Conservation and Development Project is backing efforts to protect the Kirtland's warbler, an endangered species. (Photograph courtesy of Michigan Department of Natural Resources.)

were caught, and Kirtland's warbler production per nest was the highest ever recorded.

Kirtland's warbler nesting grounds are in an area covered by the newly formed Huron Pines Resource Conservation and Development Project. Jeremy Jones, chairman of the Crawford County RC&D Committee, has indicated that his committee supports the activities of organizations trying to preserve the tiny warbler. Jones said, "Because of the combined efforts of interested groups and individuals, this is one endangered species that should be around for a long time. The Kirtland's warbler will be around to thrill those who take the time and patience to quietly wait and watch for this unique little creature." ♦

Prescribed burning improves big game range

by Thomas R. Parrish
Soil conservationist, SCS
St. Maries, Idaho

Fire can actually improve big game winter range in northern Idaho, according to a browse rehabilitation study conducted by the U.S. Forest Service and the Idaho Fish and Game Department.

The elk-sustaining brush fields were initially created by wildfire, so fire seemed to be the logical answer to rehabilitating the brush fields.

In the early 1900's, fires in northern Idaho created large expanses of mixed shrub-type vegetation, which proved to be ideal habitat for one of the nation's largest elk herds—presently numbering about 11,000 animals. Since 1934, fire control practices have prevented any large scale burns or reburns in the area.

Several of the major forage shrub species have grown beyond the reach of elk. The problem is most acute on winter range in areas of low elevation along major drainages. Idaho Fish and Game Department's elk census and harvest figures show that elk population in northern Idaho reached its peak in the 1960's and has been declining since.

Prescribed burning of browse is an ecological tool that can eliminate or control the less desirable plants, such as ninebark and oceanspray, and bring about sprouting regrowth of desirable plants that have grown too tall to be accessible to big game. With fire, a plant community can be kept at any level of succession desired.

Trial burnings on small acreages of standing brush in the St. Joe National Forest have brought good results. The tallest parts of shrubs were almost completely killed. Numerous long basal sprouts emerged during the first growing season. Big game forage was increased and became available to the animals.

Cooperators with the Benewah Soil and Water Conservation District decided to try this treatment, initiating control burns on 150 to 200 acres of private land. The treatment is expected to improve habitat for big game as well as grazing for cattle in summer and fall.

Concern over accelerated soil erosion and uncontrolled fire had generally kept this practice out of management programs. But soil erosion did not occur after the trial burnings. By burning just before the plants emerged from dormancy in the spring, the soil was without protective cover of vegetation for only a short period. Moisture in the soil at the time of burning, combined with the use of light fuels, prevented a hot, destructive fire that could have altered soil characteristics. Burning dates were coordinated with the National Weather Service.

Because of prescribed burning and the coordinated efforts of private landowners and government agencies, the prospects look bright for improving wildlife habitat and livestock forage in northern Idaho. ♦

(Above) Examining big game winter range in northern Idaho for browse rehabilitation by prescribed burning.
(Left) With fire, a plant community can be kept at any level of succession desired.

Duskies by the sea

by Winston D. Tooke
Soil conservationist, SCS
DeLand, Florida

A Dusky seaside sparrow.

The Dusky seaside sparrow (*Ammospiza maritima nigrescens)* is a rare and endangered species found no place in the world but in a small part of Brevard County, Florida.

People from many parts of the world visit the Merritt Island National Wildlife Refuge to observe this small dark bird with bright yellow markings above the eye.

According to Dr. James L. Baker, of the U.S. Department of the Interior's Fish and Wildlife Service, "The Dusky has one of the most restricted ranges of any North American bird. The daily movement of an individual bird is restricted to about 300 yards, but it may move greater distances over a period of time."

Cordgrass, commonly known as wiregrass to Brevard County ranchers, is the Dusky's predominant habitat.

"We're not sure what these birds eat," said Dr. Baker, "they feed on the ground and probably eat small insects and other invertebrates."

Dr. Baker, who is conducting a study of the bird, weighs, tags, and measures each bird he captures to help determine age, sex, movement, and life history.

The Dusky is found only in large open areas where there is little encroachment by trees and brush. Its preferred habitat occurs mostly on soils classified by the Soil Conservation Service as .Felda and Floridana. Prescribed burning has helped to reduce undesirable brush on these soils. Saltbush, however, presents somewhat of a hazard. It is not eliminated by burning and is used by red-winged blackbirds for nesting. The blackbirds drive the Dusky away from these areas.

The largest threat to the Dusky, however, comes from uncontrolled fires, new roads, land development, improved pasture, and manmade changes in water levels.

Ben Wiggins, an SCS district conservationist, and Dr. Baker have worked together to identify privately owned areas where the Dusky is present and to correlate soil type with preferred Dusky habitat.

"It's our responsibility", claimed Wiggins, "to tell the owners of areas where the Dusky is found about these endangered birds. We want to work with the landowner in preparing a conservation plan that will protect the birds."

The Brevard Soil and Water Conservation District is cooperating in this effort to protect the Dusky.

The bird is also found on the John F. Kennedy Space Center, so NASA is lending help through aerial infrared and color photography which aids in identifying vegetation, moisture, density, and other ecological factors that may affect the Dusky.

The Dusky seaside sparrow has joined the alligator, brown pelican, peregrine falcon, Florida manatee, southern bald eagle, and green turtle as a rare and endangered species in this area. But if the efforts of Brevard County landowners are successful, this tiny sparrow will not vanish from the Florida seaside. ♦

Weighing the Dusky (below, left) helps determine its age and sex. A full-grown male weighs about 20 grams.
Weighed, measured, and tagged (below, right), this Dusky is about to be set free.

On this Texas ranch 500-f
controlled.

Patterns for wildlife

by Dale D. Allen
Public information officer, SCS
Temple, Texas

Ernest M. "Buddy" Bruni of Laredo, Texas, uses pattern brush control on his ranch to get fatter deer, better hunting, and increased livestock forage.

Bruni alternates 500-foot-wide strips of uncontrolled brush with 800-foot-wide strips of controlled brush. He leaves brush along property-line fences and along creeks and drainageways. His goal is to double livestock production while improving habitat for wildlife, especially deer.

"I am keenly interested in wildlife," said Bruni. "I lease my land for hunting, so game management is part of my overall ranch operation. And strip brush control to me means good wildlife management."

According to Bruni, before he started his grassland restoration work, his land had become so badly infested with brush that forage production for livestock and wildlife was extremely limited. Mesquite, tasajillo and pricklypear cactus, lotebush, blackbrush, allthorn goatbush, and whitebrush would consume all the available moisture, leaving none to support the grasses, legumes, and forbs relished by livestock and wildlife.

Today, it's a different scene. The strips on which brush is controlled look almost like irrigated tame pasture. They contain lush stands of buffelgrass, blue panicum, and sorghum almum, planted on rootplowed land. There are also native grasses, legumes, and forbs.

"At first, hunters didn't like these strips," Bruni said. "They thought I had run off all the deer. But after hunting a few days, they began asking when I was going to do the rest of the ranch this way. They really like strip brush control now.

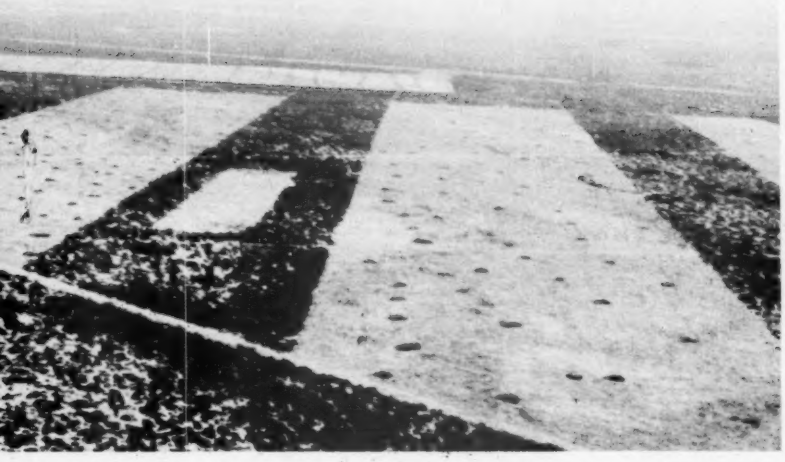
"Grassland improvement work in patterns opens up an area so you can see the game," Bruni explained. "My hunters are all trophy hunters. They want the buck with the big rack of antlers. Now that they can see the deer, they can be more selective in what they harvest.

"I think I have more wildlife now than when I started in 1969—at least, I see a lot more game now. And the deer are in better condition; there is simply more for them to eat.

"Also, we've noticed that the deer are tamer. They are getting accustomed to seeing people and traffic. Before we opened up the strips, they were so wild that you couldn't get close to them. Now, it's not uncommon for them to merely watch as you drive by in the open grass strips."

Ray Margo, district conservationist for the Soil Conservation Service at Laredo, stressed two important points about brush control work in south Texas. The Laredo SCS office gives technical help to landowners through the Webb Soil and Water Conservation District.

"First, what we're doing is



500-foot-wide strips of brush alternate with 800-foot-wide strips on which brush is

Cattle graze the lush grasses in the cleared strips.

trying to get grassland back to its original condition," Margo said. "When this area was settled, historians noted that it was a sea of grass with scattered trees and brush. Brush was somewhat thicker along streams. Overgrazing, fire, and drought destroyed the dense grass cover allowing the brush to invade. So we're controlling an unwanted invader.

"Secondly," Margo continued, "deer and most other forms of wildlife prefer to feed along the border between woods and open areas. Wildlife want the forbs, native legumes, and other preferred food plants found on grassland, but they also want escape cover nearby."

Bruni's brush control-grassland improvement program got started with Margo helping him to plan, lay out, and flag the strips. Then the brush was knocked down and raked into piles to avoid scattering the pricklypear. After the brush piles were burned, the land was rootplowed and seeded to buffelgrass, blue panicum, and sorghum almum. A period of deferred grazing and other grass management practices followed.

Laying out a strip in brush that you can hardly walk through is another matter. "It's really a job," Bruni admitted. "First, Margo sketches the pattern onto an aerial photograph. After we agree on the design, we go to the pasture and carefully measure and flag the strips for the contractor so he can cut a trail around each strip."

Bruni said that this type of brush control takes up so much time—on the part of the landowner, the SCS men, and contractor—that many contractors won't take on this type of work.

Bruni uses a checkerboard pattern for brush control on a

Ernest M. Bruni, Jr., inspects an area of uncontrolled brush on his Laredo ranch. Uncontrolled brush uses all the available moisture, leaving none for the grasses, legumes, and forbs preferred by livestock and wildlife.

tract of land southeast of Laredo. He and Margo believe that this pattern may prove better than strips. About half of the brush is controlled, yet deer can go from one end of the ranch to the other without leaving the brush.

Several thousand acres receive pattern brush control treatment in Texas every year, and the practice continues to gain in popularity. Each livestock producer selects a pattern to fit his land based on terrain, type of brush, soils, wildlife needs, and other considerations. Some use zigzags and others leave brush on shallow soils, hilltops, and along drainageways.

Whatever the pattern, Bruni likes the results—fatter game and more livestock forage. ♦

Fish conservation is largely a matter of soil and water conservation.

Most freshwater fish live in ponds, lakes, or streams that get runoff from the land. On its journey, the water picks up a variety of materials — some good for fish, some bad.

Runoff water picks up calcium, phosphorous, and potassium, which are needed by plants in ponds or lakes to make food. These tiny plants are eaten by microscopic animals which, in turn, are eaten by aquatic insects. The insects are eaten by small fish, and the small fish are eaten by large fish. Biologists call this interrelationship between mineral nutrients and the large fish a food chain. Fertile water naturally produces more pounds of fish than infertile water.

Other good things picked up by runoff water to provide food for some aquatic insects and fish are bits of leaves and other organic matter and some land insects. With fertile water and a little detritus, fish will prosper.

If the water runs off the land over crop fields where conservation practices are not used, through overgrazed pastures, over a construction site where there is much disturbed soil, or down a bare slope of strip mine spoil, the fish will suffer. Sediment has polluted their water.

Sediment can make the water so turbid that those kinds of fish that find their food by sight are unable to do so. In great enough quantity, it will suffocate some kinds of fish by coating their gills. When sediment settles to the bottom of a body of water it smothers bottom-dwelling fish food organisms. Also, sediment reduces the distance to which sunlight penetrates water; this limits the

A fish story . . .

by William H. Casey
Biologist, SCS
Lexington, Kentucky

Clean, fertile water produces healthy fish.

growth of microscopic plants at the food chain's origin. Ultimately, of course, sediment limits the pounds of fish the water can produce.

Herbicides and insecticides carried into a body of water can kill fish or, if the concentration is not great enough to kill immediately, can adversely affect ability to reproduce or make fish more susceptible to parasites and disease.

Water can be too fertile for fish life. Large amounts of inorganic fertilizers or animal wastes carried into the water stimulate growth and multiplication of the microscopic plants. When these plants die, their decomposition robs water of oxygen. Oxygen is needed by fish and other aquatic animal life. Yet nature has given plants first claim to the available oxygen. If there is not enough for both plants and animals, the animals die.

Not all water reaching a stream, pond, or lake arrives as runoff water. Some may issue from underground aquifers tapped by deep mining or oil drilling. Some may be withdrawn for industrial use and then returned. Either way, fish are victims.

Deep mining often exposes mineral deposits to air and water, setting off a chemical reaction that increases the acidity of water. If this acidic water reaches the surface and runs off into a stream, fish and other aquatic life are often destroyed for a considerable distance downstream. The same thing occurs when salt water is brought to the surface by oil drilling and dumped into streams.

Thermal pollution results when water is withdrawn from a stream for industrial cooling or other purpose and then returned to the stream at a higher temperature. Some fish are very sensitive to water temperature changes.

Water quality is determined by the way man uses land and water. Farmers and ranchers can help keep sediment out of streams and lakes by using soil and water conservation practices on their cropland and pastures. They can exercise care in the use of herbicides and insecticides so these harmful materials are not carried into fish waters. And they can build ponds designed to catch and hold animal wastes.

Builders and developers and strip mine operators can build basins to catch sediment from disturbed areas, and they can revegetate those areas as quickly as possible.

Cities can build adequate sewage treatment plants, and industries can install equipment to cool the water they heat in their industrial processes.

For most individuals, the best way to participate in the solution of water quality problems is to study them thoroughly, determine why they are problems and what can be done, and then prevail on public officials to take action. ♦

The mussels of Markell Canal

by Phil Edwards
Biologist, SCS
Raleigh, North Carolina

North Carolina landowners didn't start yesterday to do something about the conservation of their state's native plants and animals. Managing woodlands, planting food and cover plants for wildlife, building ponds for fish, and developing feeding-nesting areas for waterfowl have long been integral parts of their conservation planning.

With today's emphasis on environmental awareness, landowners' interest and concern have broadened to include plants and animals largely overlooked by the general public in the past. One such animal is the freshwater mollusk or mussel living in Markell Canal.

Markell Canal traverses the southwest corner of Pitt County. It was originally constructed by hand. In 1948, it was redug—this time with draglines—to improve farm drainage so crop production and general farming operations could be continued. Another dip-out was performed on the canal in the spring of 1973.

Freshwater mollusks or mussels were thrown onto canal banks by draglines during a maintenance redigging. The Garris family returned as many of the mussels as they could to the canal.

The canal crosses land owned by Lester Garris. It was Garris and his sons, Roland and Kenneth, who first noticed the many mussels being thrown onto the canal banks by the dragline during the 1973 renovation. They began putting the mussels back into the canal. When Soil Conservation Service people visited the site, Roland Garris explained the plight of the mussels. The SCS people collected mussel specimens and sent them to a specialist at Ohio State University for identification.

The Markell Canal mussels, while not particularly rare in North Carolina, were generally considered to be decreasing in numbers. It was also learned that not all creeks in Pitt County had mussel populations. Large populations appeared to be highly localized.

Garris and his sons were joined by the SCS people in returning as many mussels as they could to Markell Canal. Also, they carried mussels to other streams in the county with the hope that new populations could be established.

Farming and wildlife can coexist to the mutual benefit of both. Decisions of whether to have farming operations or wildlife resources do not have to be made in cases like the mussels of Markell Canal. ♦

Shelter for golden eagles

by Wilfred J. Stuart
District conservationist, SCS
Rushville, Nebraska

Golden eagles nest in the shelterbelts of Sheridan County, Nebraska. The 1,200,000 trees that have been planted in shelterbelts in the county in the last 26 years provide the eagles with nesting sites and attract the small mammals and birds they prey on.

The Soil Conservation Service, assisting the Upper Niobrara-White Natural Resource District and cooperating with state and federal wildlife agencies, has observed some of the eagle nests. A golden eagle comes back to the same nest year after year.

Two eggs were found in one nest. Both hatched, but only one of the young eagles survived. The other died in the nest, possibly killed by the stronger nestmate.

Another nest had two young goldens in it. Late one afternoon one was found on the ground near a pine tree; it was still alive. A federal game warden took the bird in and cared for it. It is now in the Henry Doorly Zoo in Omaha.

SCS observations suggest that eagles prefer rabbits for food. Pheasant remains have been found in some nests, and a dead weasel, uneaten, was found on the ground near one of the nests. These are some of the species that inhabit the shelterbeds.

Many naturalists believe that the golden eagle is one of nature's means of controlling the population of rabbits, rodents, and some birds. They doubt that eagles bother livestock if plenty of other food is available.

Legend has it that the choice of the bald eagle as our national bird was a committee compromise. Possibly the golden eagle was considered, as was Benjamin Franklin's choice—the wild turkey.

Had the golden eagle been chosen, Nebraska's shelterbelts would have been instrumental in protecting the national bird. Nevertheless, this mighty bird is well worth protecting. ♦

This young golden eagle is not quite old enough to leave his nest. Golden eagles have found ideal nesting sites in Nebraska's shelterbelts. (Photograph courtesy of Upper Niobrara-White Natural Resource District.)

Welcome Wagon for wildlife

by Ernie Busek
District conservationist, SCS
Waterville, Washington

Living conditions for thousands of residents of Douglas County, Washington, have been vastly improved in the past 2 years because of community concern.

The residents — sagehens, mule deer, mourning doves, songbirds, hawks, badgers, coyotes—live on 60,000 acres of dry wheatland and grazing land heavily infested with sagebrush.

The possibilities for improving wildlife conditions in the county were outlined at a meeting in 1971 of the supervisors of the Foster Creek Soil and Water Conservation District. Attending the meeting were 60 invited landowners and local Soil Conservation Service people.

The first step was to seek financial assistance. The Douglas County committee of the Agricultural Stabilization and Conservation Service allocated $10,000 for the wildlife project, which became known as the Withrow Project.

In 2 years, 45 pits to provide water for wildlife were dug at a cost of about $85 per pit. The pits were about 30 feet square and 8 to 10 feet deep. Sides were sloped and a ramp was built in one corner to provide easy access for four-footed animals. The pits were dug where the water table is only a few feet below the surface; most had 6 inches to 6 feet of water in them by the time digging was finished. The pits immediately began getting heavy use by wildlife.

Some of the Douglas County landowners initiated wildlife projects of their own. Lee Hanford of Bridgeport, for example, developed a spring on his land to provide water for wildlife. But the spring was in a draw, and the spring water and shade from trees growing in the draw attracted cattle. The cattle pulverized the soil, and when run-

More than 45 pits to provide water for wildlife were dug in 1971 and 1972 in Douglas County, Washington. The pits get heavy use by mule deer, mourning doves, hawks, coyotes, songbirds, and other kinds of wildlife.

off from snowmelt came down the draw, it carried away soil and manure, which eventually reached the Columbia River.

Hanford, with growing regard for wildlife and the environment, fenced the draw and seeded the area to perennial grass for wildlife habitat and to prevent further erosion. He set up a small trough to hold water for wild animals and birds and a pipe to take water beyond the fence to the cattle.

Some landowners gave special consideration to sagehens, which have lost much of their habitat in the state. Lloyd McLean, for example, had 160 acres of heavy sagebrush which he meant to spray with a herbicide. That acreage was near a large sagehen strutting ground where the males each March practice the unique sagehen courting ritual. At the suggestion of Don Galbreath and Chet Ball of the Washington State Game Department, McLean left a large area of sage for the sagehens.

Douglas County residents—the human types—have welcomed their wildlife neighbors. They enjoy the songs of birds, the antics of sagehens, and like to hear a coyote's howl once in awhile. The Withrow Project has made living in Douglas County a little better for everyone—people too. ♦

Wildlife bonanza

by Leon Fager
Wildlife biologist, SCS
Flagstaff, Arizona
and Barry Wallace
Range conservationist, SCS
Red Bluff, California

John C. Kadon, of Scottsdale, Arizona, must surely believe that a sow's ear can be turned into a silk purse. Afterall, he transformed a muddy, polluted, shallow stockwater tank into a recreation and wildlife conservation lake.

About 2 years ago, Kadon and his wife, Ann, bought land for a cabin in the Ponderosa woods of northern Arizona. "When we inspected the place before buying," Kadon said, "we noticed the small mud tank and thought then it might be suitable for warm or cold water fish."

After discussing their plan with local ranchers and biologists and engineers of the Soil Conservation Service, the Kadons decided to go ahead with their wildlife conservation project.

Earth-moving equipment extracted or moved 12,000 cubic yards of dirt. The 5-acre lake is actually an earthen dam. It is 10 feet deep and has a 400-foot dike, 20 feet wide, at one end.

Contracting with a private fish hatchery, the Kadons bought catchable-size rainbow trout to stock the lake. Rainbow trout do not reproduce in small ponds, so the lake will have to be stocked every year.

Following SCS' recommendations, Kadon installed a four-strand wire fence around the upper perimeter of the lake to keep out the several hundred beef cattle that roam the open range in the area. The mile-long fence is concealed by trees and bushes, preserving the esthetic appearance of the lake. When the lake is full, the water line extends beyond the fence and provides water for the cattle.

Kadon bought Japanese millet and sago pondweed tubers from wild-game food nurseries in California and central Wisconsin. SCS biologists gave technical assistance in the planting. The millet and pondweed will provide food for wild animals and birds, including waterfowl. Deer and antelope may also be attracted by the game food. Waterfowl already visit the wildlife area.

The Kadons plan to use their lake primarily for relaxation and enjoyment, rather than for fishing and hunting. "We feel that private wildlife and outdoor areas are rapidly diminishing in this country," they said. It is with this concern that the couple built the Lake Ponderosa wildlife preserve. ♦

Wildlife in your yard: to enjoy and photograph

by Robert O. Koerner
Biologist, SCS
Lincoln, Nebraska

Margaret Mead, the noted anthropologist, once said, "People move to the country to escape the city. Soon the country becomes the city."

Nature eludes pursuit. Nevertheless, if you live in the city there are ways of bringing nature and wildlife to you. You can "design with nature," as Ian L. McHarg, chairman of the University of Pennsylvania's Department of Landscape Architecture and Regional Planning, states in his book on the subject. Attract wildlife to your backyard by planting flowering and fruiting trees and shrubs. Border plantings are certainly more attractive than chain-link fences.

After you have attracted animals and birds to your backyard, you can simply enjoy watching them, or if you are a photographer your bonus is an abundance of live wildlife models.

Here is the method I have used to take wild animal portraits.

First, I enlisted my family in helping to develop an area in our yard that made wildlife want to visit or live there. Following a landscape plan, we planted trees, shrubs, vines, and flowers. When these had grown sufficiently to attract wildlife, we put up a feeding station. This can be done in several ways. We built ours near a window that could double as a photography blind and viewing station. Behind the feeder we built a frame to support vines, such as bittersweet, and other plants, such as firethorn and multiflora rose. By having a natural background the quality of wildlife photographs is greatly improved.

Berries and fruits on the plants provided natural winter food for cardinals, bluejays, evening grosbeaks, tufted titmice, nuthatches, juncos, chickadees, and other songbirds. When this food was gone we replaced it with fruit-laden branches from field plants or from border plantings in the yard that needed trimming.

If you encourage the concentration of birds with a feeder, you should be prepared to assume certain responsibilities. One is that the birds become dependent on you for their food. Plan to have a full winter-long feeding program or don't start one at all.

Another responsibility is keeping house cats away from birds. Even though you may not own a cat yourself, the neighbors usually do. A collar with several bells on our cat did a good job of keeping him and the birds apart.

A feeding station attracts more than just birds. Last winter five fox squirrels paid regular visits to our feeders. We did not try to discourage them. Some squirrels became so tame that they would eat from our hands.

Starting with the first snowfall in October 1971 and ending in May 1972, we tried to see how many birds we could attract and photograph at our feeding station. Taking photographs through a glass windowpane proved unsuccessful. So, we removed the entire window and replaced it with a sheet of plywood. Then we cut holes in the plywood big enough to get a single lens reflex camera and electronic flash head through them. We cut a third hole for viewing, so that we didn't have to look through the camera lens all the time. When not in use, the holes were covered with sheets of clear, rigid plastic secured by wing nuts.

To keep cold air out while

If you want to attract birds to your home, you can get information on plants, soils, and conservation methods at your local conservation district office. The Soil Conservation Service, as part of its assistance to conservation districts, helps land owners and users to apply many conservation practices that increase wildlife.

The following U.S. Department of Agriculture publications may be helpful:

Conservation plantings for the Northeast (PA-940)
Conservation plantings for the Midwest (PA-982)

the camera and flash were extended through the openings, we cut flat pieces from an old rubber innertube large enough to fit over the openings. The rubber was secured to the plywood in the same manner as the plastic sheets. Then, in the center of the rubber covering we cut a round hole just slightly smaller than the lens. When the lens was extended through this opening, outside air was kept out of the house. This allowed us to set up the equipment on weekends and leave it. When activity picked up at the feeding station, we could observe and photograph.

During the winter we saw

Evening grosbeaks (above) are quite tame and easy to photograph, especially where there's a lot of sunflower seeds.
(Left) A bird feeding station attracts more than just birds.

and photographed 18 bird species. Birds and squirrels became accustomed to the flash; as long as they didn't see us they would continue to feed, and we could take pictures as we pleased. The male cardinals were the only birds that never became tame enough for us to take the photos that we wanted.

It is never too soon or too late to start your backyard wildlife program. The cost for this rewarding winter pastime is minimal. And you may get a once-in-a-lifetime chance to photograph a rare species. ♦

Recon . . .

Land use law. New Hampshire's legislature has enacted a land use law to protect open space and wildlands. The new act will shield such lands by providing for assessment at the value of present usage. Under the former state law, land could be assessed at its potential development value.

Save on fuel and labor. Farmers can realize a double savings—on fuel and labor—if they opt for some form of reduced tillage when planting their crops. And the savings can be considerable. USDA engineers calculate farmers can just about cut their fuel needs in half and their labor needs by 40 percent if they practice reduced tillage (which skips plowing, disking, and harrowing) or minimum tillage (which uses a till planter). No-till systems are even more economical where soil conditions permit their use. Savings can amount to as much as 80 percent on fuel and 60 percent on labor.

Michigan has enacted a property tax exemption for seawalls or jetties built to stop erosion on the Great Lakes shore.

It's happening everywhere. Many people might look at North Dakota's wide open spaces and thin population and conclude that land use planning and zoning aren't necessary there. Much land in North Dakota is agricultural and will probably remain in farms, but some areas of the state can expect shifts in land uses, making planning and zoning valuable if not essential, according to Elmer Vangsness, extension resource development economist at North Dakota State University.

The Ford Foundation has awarded 10 grants totaling $13,710 to help local conservation commissions establish programs to deal with a variety of environmental problems affecting their communities. Grants ranging from $750 to $2,110 were awarded to commissions in the following communities: Amherst, N.H.; Binghamton, N.Y.; Caroga Lake, N.Y.; Egg Harbor Township, N.J.; Hampton Falls, N.H.; Hamptonburgh, N.Y.; Oneonta, N.Y.; Pohatcong, N.J.; Shirley, Mass.; and Windham, N.H.

International efforts to protect wildlife in underdeveloped nations have been established as Rare Animal Relief Effort (RARE). Early projects include preservation of rain forests in Puerto Rico and pressure on nations to limit whaling to International Whaling Commission quotas.

Under the Federal Environmental Pesticide Act of 1972, pesticides are classified in two categories, restricted use and general use. General use pesticides will not usually cause adverse effects on the environment or injury to the applicator. No certification is necessary for the application of this class. Restricted use pesticides may cause adverse effects on the environment or injury to the applicator. Certification will be required for the application of these pesticides when the law takes effect in 1976.

Law takes the worry from wildlife. Federal protection of endangered wildlife became law during the twilight hours of the 1973 Congressional session. The new law requires states to set up programs protecting species in danger of extinction. It authorizes funds and outlines beginning procedures. If a state has not completed a program within 15 months, the Department of the Interior can preempt the state and take over protection of its endangered wildlife. Another important feature of the bill is that it sets forth two types of lists—one now covering endangered species and a new list enumerating threatened species.

State's stake in conservation. Iowa's cost-sharing program for permanent conservation practices has been very successful in its first year of operation, reported Wilson T. Moon, SCS State Conservationist for Iowa. In the first 6 months, more than 2,000 requests were received, of which 1,420 were approved for assistance. The approvals include 920 terraces, 125 diversions, 105 waterways, and 150 grade stabilization structures.

Recycling—raw materials vs. energy. Recycling of materials is one way of conserving raw resources for future use. Unfortunately, according to a Stanford University Ecology House report, recycling may be a classic case of an environmental trade-off. Recycling may conserve raw materials, but it uses energy—more energy than possibly would be needed to make a new product. In short, by recycling, we save raw materials but spend energy.

Review

Threatened Wildlife of the United States. *1973. U.S. Dept. of the Interior, Bureau of Sport Fisheries and Wildlife, Resource Pub. 114. 289 pp.* Presents data on the status of species or subspecies of vertebrates whose existence is threatened in the United States, including the Virgin Islands and Puerto Rico. Two previous editions of this publication differ from this third edition in that "threatened" has been substituted for the designations "rare" and "endangered." This change was made primarily to emphasize that the listing in this publication is not the official list of "endangered" species. That list, compiled by USDI, is published in the *Federal Register.* It includes 109 species and subspecies of fish and wildlife—31 fishes, 8 reptiles and amphibians, 53 birds, and 17 mammals. Addresses of state conservation agencies are given in an appendix, and a state-by-state listing of endangered species is also included.

Beef Cattle Production Potential of Set-Aside Land. *1973. Economic Research Service-USDA (ERS-532). 44 pp., tables and maps.* This report summarizes research conducted by ERS on set-aside land on sample farms with beef cows, the effects of alternative set-aside provisions, feeder cattle production on set-aside land, and potential changes in set-aside program payment rates. Approximately 449 counties were included in the 23 study subregions; 1,169 farmers were interviewed by the ERS task force.

Linear Theory of Hydrologic Systems. By James C. I. Dooge. *1973. USDA Tech. Bull. 1468. 327 pp., illus. with graphs and charts.* Hydrologic systems are basic to computations for successfully planning the best use of soil and water resources in agricultural watersheds. This publication discusses the general principles of the linear theory of deterministic hydrologic systems. The author is a world authority on the subject.

Planning For An Individual Water System. 1973. American Association For Vocational Instructional Materials (AAVIM), in cooperation with the Agricultural Research Service and Environmental Protection Agency (Water Programs Branch). (AAVIM, Engineering Center, Athens, Georgia 30602.) 156 pp., illus. $6.75. This book tells how to plan for a safe and adequate water supply. It was developed for the person who has the responsibility of providing a water system for a suburban home, vacation home, farm or ranch. It can be helpful to a person engaged in developing water sources such as wells, cisterns, and small lakes for domestic water supply. The information is basic, and the format is simplified for easy learning.

Meetings

April

1–2 *American Pulpwood Association, Atlanta, Ga.*
1–2 *Wildlife Society, Denver, Colo.*
2–6 *Association of Interpretive Naturalists, Inc., Asilomar Beach, Calif.*
3–5 *Twelfth Annual Symposium on Engineering Geology and Soils Engineering, Boise, Idaho*
3–6 *National Rivers and Harbors Conference, Washington, D.C.*
8–12 *American Geophysical Union, Washington, D.C.*
9–11 *Identification and Transformation of Aquatic Pollutants Symposium, Athens, Ga.*
21–24 *National Water Safety Congress, Charleston, W. Va.*
22–24 *National Academy of Sciences, Washington, D.C.*
24–26 *Hardwood Plywood Manufacturers Association, New Orleans, La.*
26–28 *The Nature Conservancy, Washington, D.C.*
28–30 *Chamber of Commerce of the United States, Washington, D.C.*
28–May 1 *Association of American Geographers, Seattle, Wash.*

May

2–3 *California Fertilizer Conference, Anaheim, Calif.*
5–8 *National Forest Products Association, Washington, D.C.*
12–16 *National Council of State Garden Clubs, Inc., Boston, Mass.*
19–25 *Soil Stewardship Week*
20–23 *American Institute of Architects, Washington, D.C.*

June

16–19 *National Watershed Congress, Pittsburgh, Pa.*
23–26 *American Society of Agricultural Engineers, Stillwater, Okla.*
23–27 *National Environmental Health Association, Cincinnati, Ohio*
24–28 *American Society of Civil Engineers National Symposium on Water Quality Planning, Ithaca, N.Y.*
24–28 *American Society for Testing and Materials, Washington, D.C.*

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Soil surveys

Alaska

Salcha-Big Delta Area. By Dale B. Schoephorster. *1973. Soil Conservation Service in cooperation with University of Alaska Institute of Agricultural Sciences. 51 pp., illus.; maps.*

Susitna Valley Area. By Dale B. Schoephorster and Robert B. Hinton. *1973. Soil Conservation Service in cooperation with University of Alaska Institute of Agricultural Sciences. 71 pp., illus.; maps.*

California

San Diego Area. (San Diego County excluding the Anza-Borrego and Cuyamaca State Parks) Part I and Part II. By Roy H. Bowman, Ralph E. Bishop, Roy W. Griffin, Marvin L. Jones, the County of San Diego Planning Department and the Comprehensive Planning Organization. *1973. Soil Conservation Service and Forest Service in cooperation with University of California Agricultural Experiment Station, U.S. Department of the Interior, Bureau of Indian Affairs, Department of the Navy, U.S. Marine Corps. 104 and 118 pp. respectively, illus.; maps.*

Colorado

Alamosa Area. By James P. Pannell, James M. Yenter, Stanley O. Woodyard, and Richard E. Mayhugh. *1973. Soil Conservation Service in cooperation with Colorado Agricultural Experiment Station. 122 pp., illus.; maps.*

Baca County. By Stanley O. Woodyard, Rodney E. Preator, Ronald E. Moreland, and M. Bruce McCullough. *1973. Soil Conservation Service and Forest Service in cooperation with Colorado Agricultural Experiment Station. 55 pp., illus.; maps.*

Georgia

Berrien and Lanier Counties. By Joe G. Stevens. *1973. Soil Conservation Service in cooperation with University of Georgia, College of Agriculture, Agricultural Experiment Stations. 66 pp., illus.; maps.*

Cobb County. By Grover J. Thomas, Jr. *1973. Soil Conservation Service in cooperation with University of Georgia, College of Agriculture, Agricultural Experiment Stations. 70 pp., illus.; maps.*

Idaho

Bingham County. By Richard A. Salzmann and Jack O. Harwood. *1973. Soil Conservation Service in cooperation with University of Idaho, Idaho Agricultural Experiment Station. 123 pp., illus.; maps.*

Kansas

Crawford County. By Donald E. Rott, Deane W. Swanson, and George N. Jorgensen, Jr. *1973. Soil Conservation Service in cooperation with Kansas Agricultural Experiment Station. 50 pp., illus.; maps.*

Hodgeman County. By Roger Lee Haberman, Darold A. Dodge, and John Bradley Baumann. *1973. Soil Conservation Service in cooperation with Kansas Agricultural Experiment Station. 56 pp., illus.; maps.*